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YODL2: Developing a search interface for multimedia content at the University of York

Open Repositories 2010 Fedora User Group Presentation Proposal

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Abstract

At the University of York, the Digital Library (YODL) have committed to using Fedora as the repository for preservation of its digital content. Our requirements for storing rich multimedia content along with the need to apply a diverse set of access control policies had initially lead us to trial Muradora [1] for the search and access interface. For a number of reasons, we are now moving to a new interface, being developed in house during 2010 to replace our current Muradora-based interface.

This paper presents our requirements, design decisions and challenges faced implementing the new search interface – YODL2, focusing on the image search aspect of our multimedia repository.

Requirements

York's requirements for image search initially focus on still images and particularly on the needs of the Department of History of Art here at York. In addition, as YODL will hold collections of manuscript material, there is an added requirement for a way of navigating through sequences of images, in the style of a page turning application.

From the outset of this work we have been keen to involve key stakeholders in the design and usability testing of the system. Requirements elicitation was approached in two ways, usability sessions were conducted on the existing Muradora interface, applying “think aloud”/protocol analysis techniques to gather feedback and glean new requirements. Wireframe prototypes were made based on the output and presented to stake holders, early involvement of users in the design helped confirm requirements and assist the “buy in” process for a new system.

Design decisions

The search framework was initially prototyped in C# ASP.NET MVC and later migrated to Java Spring MVC (Model View Control) to fit in with the universities java centric production environment. Spring framework was chosen due its maturity and support for features like Aspect oriented programming (AOP) and a solid testing infrastructure. A key strand of York's development will involve testing the access control aspects of the system, spring frameworks support for mock objects, unit testing and integration testing will assist this development process. User interface testing with selenium will also be considered.

The design of the interface was motivated by two key themes, simplicity of form and accessibility. The interface designs were based on the Grid systems, Yahoo! UI (YUI) Library grid was the chosen CSS framework. Interaction designs were carefully considered based on recommended design patterns [2]. Rich client side interactions were implemented using YUI components and supported by WCAG 2.0 [3], WAI-ARIA [4] techniques where applicable.

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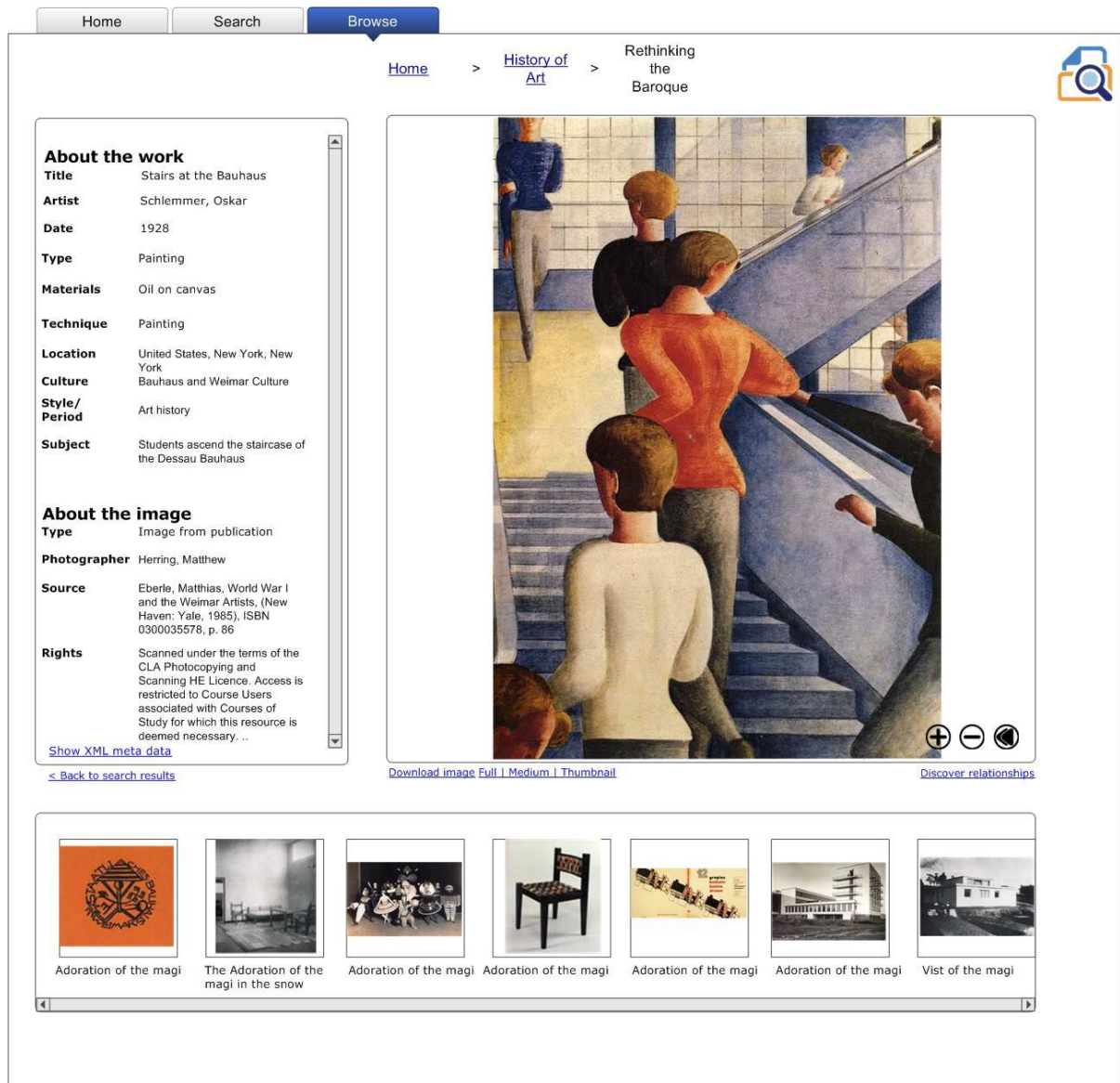


Figure 1 Wireframe for detailed view of an image, along with ability to zoom and pan and browse remaining images in a collection

A requirement for filtering particularly by date periods, for example searching specific periods like 12th century art or by broader date ranges, was noted during the requirements exercise. To support this and represent the diverse set of data about images, the Digital Library have adopted VRA Core 4 [5] metadata as it allows for rich description of images, backed by terms sourced from the Getty Union List of Artist Names, Thesaurus of Geographic Names and the Art and Architecture Thesaurus. See Figure 1 for an illustration of a prototype resource view page from our new interface design. A decision to implement faceted navigation to narrow search results was made, Solr search server [6] is used to perform full text indexing of VRA and Dublin core, along with providing faceting functionality. Search interface integration with Solr is achieved using SolrJ while Solr Fedora integration is currently managed by Muradora's SolrDOManager and associated request handler although using Fedora Generic Search Service is being considered.

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Another key development, carried on as part of our work on the JISC-funded YODL-ING project, is to build discovery tools to assist users searching the system. A prototype tool which applies semantic techniques in order to discover relationships between terms in the Getty Union List of Artists' Names (ULAN) is being developed by at York working with developers at Acuity Unlimited. This tool will explore the application of visualisation techniques such as Xerox Parc Hyperbolic Tree to navigate relationships within ULAN. For example exploring artists who collaborated with Pablo Picasso or exploring the lineage of an artist. The underlying data is stored as SKOS RDF schema, the translation between structured ULAN and SKOS is assisted by tools from the MultimediaN's project [7].

The requirements for image content viewing, zooming, panning exist within the History of Art, with additional requirements for viewing sequences of images such as manuscript by page turning. There are a number of technologies available for creating these interactions, such as Flex and Silverlight. In selecting a technology, it is important to gather metrics comparing openness, accessibility, technical features and development tools. We have compiled an analysis and comparison and build prototype systems which will be demonstrated.

Challenges

There are many development challenges facing YODL2, including migrating access control policies from Muradora and enforcing access control on resources using Solr indexes. In using Muradora, we have experienced significant performance issues and have already experimented with a number of techniques, such as batching up requests to reduce the number of web service calls to improve performance along with detailed logging to identify bottlenecks in the system. In drilling down into these performance issues we hope to apply some of the learning to future development, and to feed this into work on our own interface and also into work on FeSL.

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